

## **REMARKS/ARGUMENTS**

### **STATUS OF CLAIMS**

The Office Action (1) rejected claim 19 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement; (2) rejected claims 1-3, 6, 9, 12, 15, 16 and 19.

The Office Action:

(1) rejected claims 19 under 35 U.S.C. §112, second paragraph, for failing to particularly point out and distinctly claim the subject matter which the Applicants regard as the invention;

(2) rejected claims 1-3, 6, 9, 12, 15, 16 and 19 under 35 U.S.C. §102(e) as being anticipated by Bosch (U.S. Patent 6,506,254);

(3) rejected claims 4 and 26 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Wang (U.S. Patent Publication 2003101 88685), Inazawa (U.S. Patent 5,595,627), Miller (U.S. Patent 4,439,463) and Frankel (U.S. Patent 6,019,848);

(4) rejected claims 5 and 7 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Zhao (U.S. Patent 5,885,356);

(5) rejected claim 8 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Zhao as applied to claim 5 above, and further in view of Freiberger (U.S. Patent 3,880,396);

(6) rejected claims 10 and 13 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Zhao (U.S. Patent 5,968,379);

(7) rejected claims 10 and 13 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Sopory (U.S. Patent 6,492,629);

(8) rejected claim 11 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Collins (U.S. Patent 6,063,233);

(9) rejected claims 20-25 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Collins (U.S. Patent 6,063,233);

(10) rejected claims 1-3, 6, 9, 12, 15, 16 and 19 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Wang;

(11) rejected claims 4 and 26 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Wang as applied to claims 1-3, 6, 9, 12, 15, 16 and 19 above, and further in view of Inazawa, Miller and Frankel;

(12) rejected claims 5 and 7 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Wang as applied to claims 1-3, 6, 9, 12, 15, 16 and 19 above, and further in view of Zhao;

(13) rejected claim 8 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Wang and Zhao as applied to claims 1-3, 6, 9, 12, 15, 16 and 19 above, and further in view of Freiberger;

(14) rejected claims 10 and 13 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Wang as applied to claims 1-3, 6, 9, 12, 15, 16 and 19 above, and further in view of Zhao;

(15) rejected claims 10 and 13 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Wang as applied to claims 1-3, 6, 9, 12, 15, 16 and 19 above, and further in view of Sopory;

(16) rejected claim 11 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Wang as applied to claims 1-3, 6, 9, 12, 15, 16 and 19 above, and further in view of Collins;

(17) rejected claims 1-3, 6, 9, 12, 15, 16, and 19-25 under 35 U.S.C. §103(a) as being unpatentable over Collins in view of Wang and Bosch;

(18) rejected claims 4 and 26 under 35 U.S.C. §103(a) as being unpatentable over Collins, Wang and Bosch as applied to claims 1-3, 6, 9, 12, 15, 16 and 19 above, and further in view of Inazawa, Miller and Frankel;

(19) rejected claims 5 and 7 under 35 U.S.C. §103(a) as being unpatentable over Collins, Wang and Bosch as applied to claims 1-3, 6, 9, 12, 15, 16 and 19 above, and further in view of Zhao;

(20) rejected claim 8 under 35 U.S.C. §103(a) as being unpatentable over Collins, Wang, Bosch and Zhao as applied to claims 1-3, 6, 9, 12, 15, 16 and 19 above, and further in view of Freiberger;

(21) rejected claims 10 and 13 under 35 U.S.C. §103(a) as being unpatentable over Collins, Wang and Bosch as applied to claims 1-3, 6, 9, 12, 15, 16 and 19 above, and further in view of Zhao;

(22) rejected claims 10 and 13 under 35 U.S.C. §103(a) as being unpatentable over Collins, Wang and Bosch as applied to claims 1-3, 6, 9, 12, 15, 16 and 19 above, and further in view of Sopory;

(23) rejected claim 11 under 35 U.S.C. §103(a) as being unpatentable over Collins, Wang and Bosch as applied to claims 1-3, 6, 9, 12, 15, 16 and 19 above, and further in view of Collins.

## **RESPONSE TO REJECTIONS**

(1) Regarding the rejection of claim 19 under 35 U.S.C. §112 and 35 U.S.C. §101, Applicants have amended the claim. Specifically, Applicants have amended claim 19 to provide a limitation that the heater liner does not emit contaminating atoms. Applicants submit that there is no new material added, and supports for the present amendment can be found at least in paragraphs [0019] and [0022], which disclose that contamination atoms are contamination to the substrate.

(2) Regarding the rejection of claims 1-3,6, 9, 12, 15, 16 and 19 under 35 U.S.C. §102(e) as being anticipated by Bosch, Applicants have amended the claims to particularly point out the innovative features of the present invention. Specifically, Applicants have amended the claims to provide a limitation that the heater liner covers a substantial portion of the leakproof wall that is exposed to the plasma and presents a metal or a plurality of metals and is adapted to contact the plasma. Applicants submit that there is no new material added, and supports for the present amendment can be found at least in Fig. 2, and paragraphs [0020] and [0053]. As shown in Fig. 2 and discussed in paragraph [0053], the heater liner 14 overlays the inside of a significant portion of the leakproof wall 2 that is in contact with the plasma. The heater liner 14 is made of a metal or plurality of metals, and thus presents a metal or plurality of metals contacting the plasma.

Applicants submit that the present amended claims are not anticipated by Bosch since Bosch fails to disclose at least an element of the present claims, namely a heater liner consisting of a metal or plurality of metals contacting the plasma.

(3) Regarding the rejection of claims 4 and 26 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Wang, Inazawa, Miller and Frankel, Applicants submit that these are dependent claims, and thus should be patentable at least by the reasons stated by the independent claim.

(4) Regarding the rejection of claims 5 and 7 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Zhao, Applicants submit that these are dependent claims, and thus should be patentable at least by the reasons stated by the independent claim.

(5) Regarding the rejection of claim 8 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Zhao as applied to claim 5 above, and further in view of Freiberger, Applicants submit that this is a dependent claim, and thus should be patentable at least by the reasons stated by the independent claim.

(6) Regarding the rejection of claims 10 and 13 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Zhao, Applicants submit that these are dependent claims, and thus should be patentable at least by the reasons stated by the independent claim.

(7) Regarding the rejection of claims 10 and 13 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Sopory, Applicants submit that these are dependent claims, and thus should be patentable at least by the reasons stated by the independent claim.

(8) Regarding the rejection of claim 11 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Collins, Applicants submit that this is a dependent claim, and thus should be patentable at least by the reasons stated by the independent claim.

(9) Regarding the rejection of claims 20-25 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Collins, Applicants submit that both Bosch and Collins fail to disclose a heater liner consisting of a metal or a metal alloy contacting the plasma.

(10) Regarding the rejection of claims 1-3, 6, 9, 12, 15, 16 and 19 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Wang, Applicants have amended the claims to particularly point out the innovative features of the present invention. Specifically, Applicants have amended the claims to provide a limitation that the heater liner consists of a metal or a plurality of metals and is adapted to contact the plasma. Applicants submit that the present amended claims are not obvious in view of Bosch and Wang since Bosch and Wang all fail to disclose at least an element of the present claims, namely a heater liner consisting of a metal or a plurality of metals and adapted to contact the plasma.

In an embodiment, the present invention discloses a heater liner consisting of a metal or a plurality of metals and adapted to contact the plasma. The metal heater can provide thermal uniformity, especially when facing with the bombardment of the active plasma species. The heater can be made of metal alloys, which consist of different metal components.

In contrast, Bosch discloses a ceramic liner contacting the plasma. The present heater liner consists of metal components, and thus is different from Bosch's ceramic liner, which comprises at least a non-metal component, such as oxygen, silicon, carbon or nitrogen component (Col. 3, lines 13-19). Bosch specifically discloses a ceramic liner which has been shaped and treated to improve particle performance. Bosch offers no suggestion or motivation to use metal liners which contact the plasma.

Wang discloses metal shield 150 to shield components or portions of walls from the plasma. Wang fails to disclose a liner covering substantially all of the vertical chamber walls. In fact, the metal shield of Wang cannot surround the plasma since doing so would block the power transfer from the coil 360 to the process chamber.

In addition, the metal shield of Wang is not heated, with an explicit purpose of shielding the components of portions of the chamber walls. Wang offers no suggestion or motivation to heat the metal shielding. Thus, Applicants submit that it would not be obvious to combine the art of Bosch with the art of Wang to provide the present invention heated metal liner.

For example, it would not be obvious to apply the surrounding liner of Bosch to the metal shield of Wang, since doing so would prevent the operation of Wang process chamber. Wang discloses a power antenna position outside the process chamber to transfer inward. Using a metal liner would effectively shield this power transfer and render the process chamber non-operative. Also, it would not be obvious to use a metal shield of Wang to the ceramic liner of Bosch, since Bosch teaches that non-containing-aluminum liner can reduce aluminum contamination of processed substrates (Col. 10, lines 47-49).

Thus, Applicants submit that the present claims are patentable in view of Bosch and Wang since both of these prior arts fail to disclose an element of the present claims, namely a heater liner consisting of a metal or plurality of metals and adapted to contact the plasma.

(11) Regarding the rejection of claims 4 and 26 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Wang as applied to claims 1-3, 6, 9, 12, 15, 16 and 19 above, and further in view of Inazawa, Miller and Frankel, Applicants submit that these are dependent claims, and thus should be patentable at least by the reasons stated by the independent claim.

(12) Regarding the rejection of claims 5 and 7 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Wang as applied to claims 1-3, 6, 9, 12, 15, 16 and 19 above, and further in view of Zhao, Applicants submit that these are dependent claims, and thus should be patentable at least by the reasons stated by the independent claim.

(13) Regarding the rejection of claim 8 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Wang and Zhao as applied to claims 1-3, 6, 9, 12, 15, 16 and 19 above, and further in view of Freiberger, Applicants submit that this is a dependent claim, and thus should be patentable at least by the reasons stated by the independent claim.

(14) Regarding the rejection of claims 10 and 13 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Wang as applied to claims 1-3, 6, 9, 12, 15, 16 and 19 above, and further in view of Zhao, Applicants submit that these are dependent claims, and thus should be patentable at least by the reasons stated by the independent claim.

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(16) Regarding the rejection of claim 11 under 35 U.S.C. §103(a) as being unpatentable over Bosch in view of Wang as applied to claims 1-3, 6, 9, 12, 15, 16 and 19 above, and further in view of Collins, Applicants submit that this is a dependent claim, and thus should be patentable at least by the reasons stated by the independent claim.

(17) Regarding the rejection of claims 1-3, 6, 9, 12, 15, 16 and 19 under 35 U.S.C. §103(a) as being unpatentable over Collins in view of Wang and Bosch, Applicants have amended the claims to particularly point out the innovative features of the present invention. Applicants submit that the present amended claims are not obvious in view of Collins, Bosch and Wang since Collins, Bosch and Wang all fail to disclose at least an element of the present claims, namely a heater liner consisting of a metal or a plurality of metals and adapted to contact the plasma.

Collins is silent with respect to heater liner. Bosch discloses a ceramic liner contacting the plasma. Wang discloses metal shield to shield components or portions of walls from the plasma. Similar to the above discussion, Applicants submit that the present heated metal liner is not obvious in view of Collins, Bosch and Wang.

(18) Regarding the rejection of claims 4 and 26 under 35 U.S.C. §103(a) as being unpatentable over Collins, Wang and Bosch as applied to claims 1-3, 6, 9, 12, 15, 16 and 19 above, and further in view of Inazawa, Miller and Frankel, Applicants submit that these are dependent claims, and thus should be patentable at least by the reasons stated by the independent claim.

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(20) Regarding the rejection of claim 8 under 35 U.S.C. §103(a) as being unpatentable over Collins, Wang, Bosch and Zhao as applied to claims 1-3, 6, 9, 12, 15, 16 and 19 above, and further in view of Freiberger, Applicants submit that this is a dependent claim, and thus should be patentable at least by the reasons stated by the independent claim.

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(22) Regarding the rejection of claims 10 and 13 under 35 U.S.C. §103(a) as being unpatentable over Collins, Wang and Bosch as applied to claims 1-3, 6, 9, 12, 15, 16 and 19

above, and further in view of Sopory, Applicants submit that these are dependent claims, and thus should be patentable at least by the reasons stated by the independent claim.

(23) Regarding the rejection of claim 11 under 35 U.S.C. §103(a) as being unpatentable over Collins, Wang and Bosch as applied to claims 1-3, 6, 9, 12, 15, 16 and 19 above, and further in view of Collins, Applicants submit that this is a dependent claim, and thus should be patentable at least by the reasons stated by the independent claim.

### **CONCLUSION**

In view of the above amendments and remarks, it is respectfully submitted that all of the claims now pending in the subject patent application should be allowable, and reconsideration thereof is respectfully requested. The Examiner is respectfully requested to telephone the undersigned if he can assist in any way in expediting issuance of a patent.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 06-1325 for any matter in connection with this response, including any fee for extension of time, which may be required.

Respectfully submitted,

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